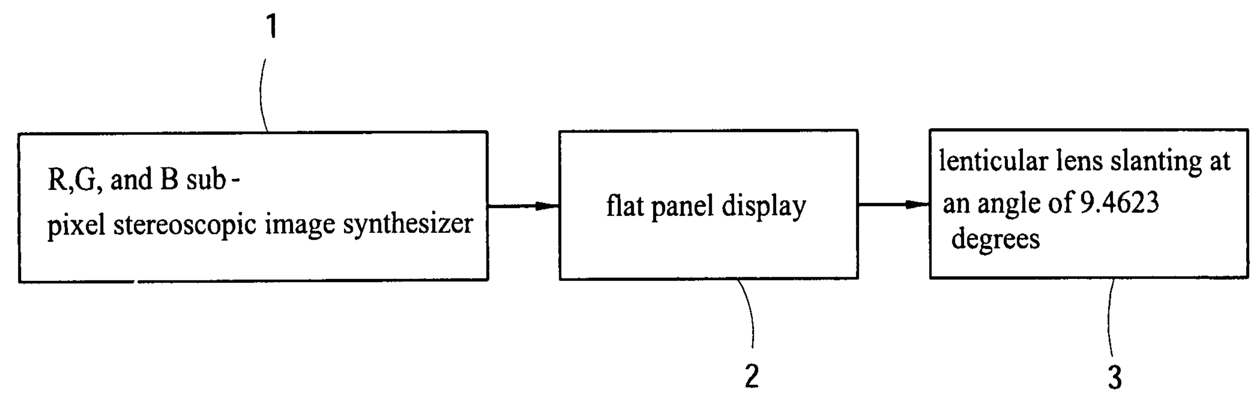

1
R,G, and B sub-
pixel stereoscopic image synthesizer
flat panel display
2
lenticular lens slanting at
an angle of 9.4623
degrees
3

Fig.1

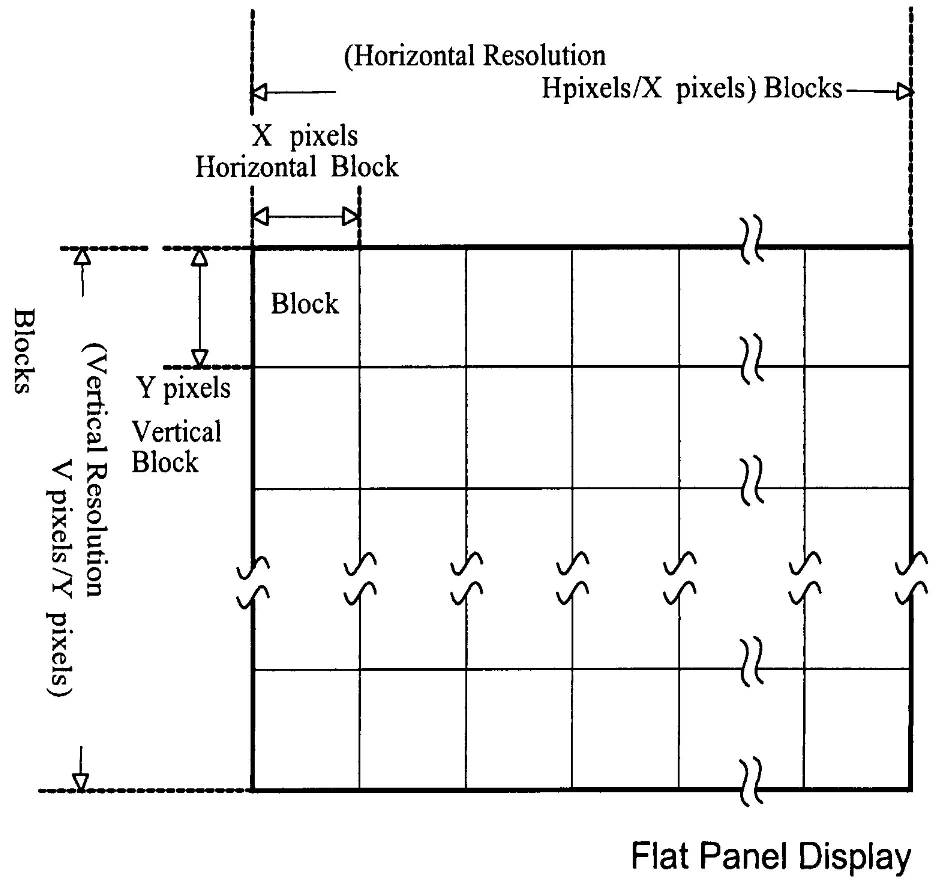
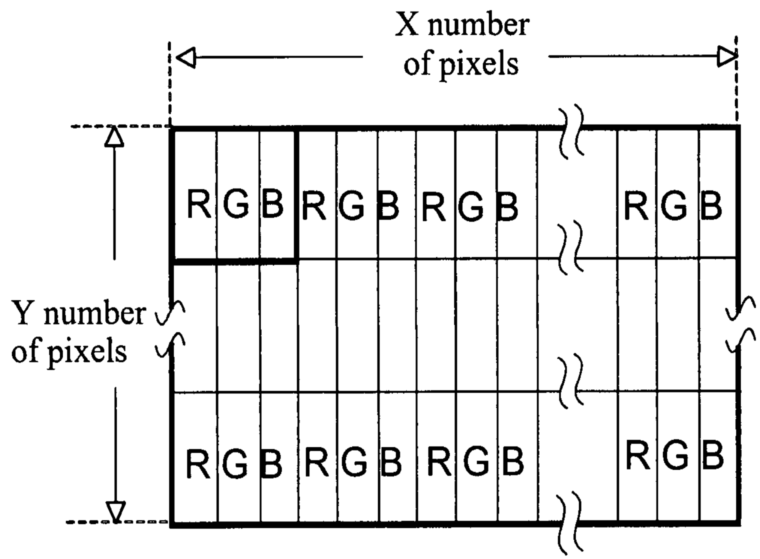

(Horizontal Resolution
Hpixels/X pixels) Blocks
X pixels
Horizontal Block
Block
Y pixels
Vertical
Block
(Vertical Resolution
V pixels/Y pixels)
Blocks
Flat Panel Display

Fig.2



structure diagram of a block

Fig.3

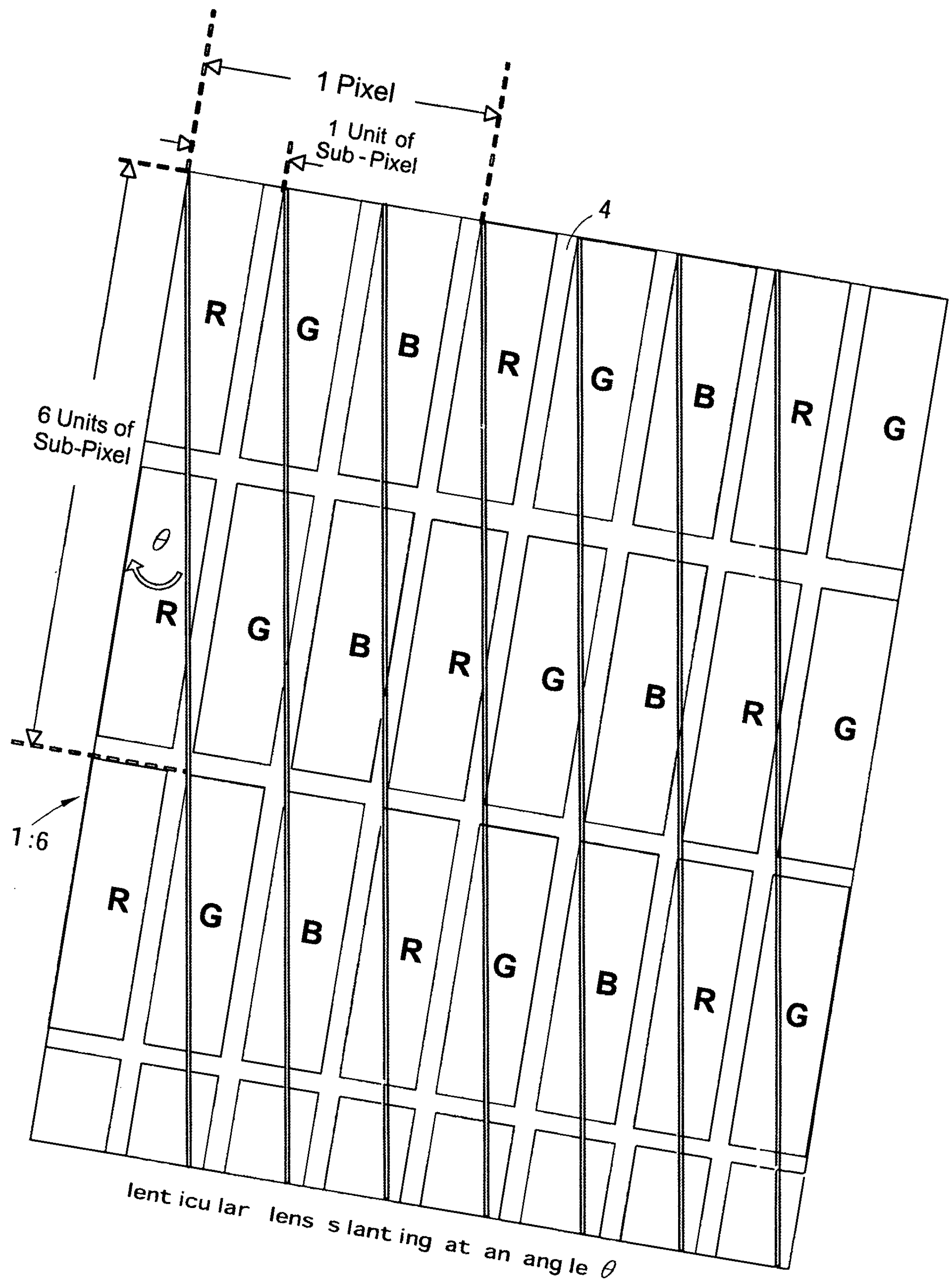

1 Pixel
1 Unit of
Sub - Pixel
4
6 Units of
Sub-Pixel
θ
1:6
R
G
B
R
G
B
R
G
R
G
B
R
G
B
R
G
R
G
B
R
G
B
R
G
lenticular lens slanting at an angle θ

Fig.4

Illustration of Algorithm	
Each view image is separately stored in the block (Total number of pixels : (Block_x) ×(block_y)) The view image stored in each block will be rearranged by sub - pixels and placed in an appropriate address (i.e., mus t be in accordance with the specification of lenticular lens, LCD dot pitches, and the number of views). The pixels of each view stored in each block (Total number of pixels : (Block_x) × (Block_y)) will be sequentially mapped to the small Map Blocks at different Destinations. (the size is: (N_x)×(N_y) pixels)	
N : (number of views)	8 、9 、10 、12 N = 8 N = 9 N = 10
N_x : (number of horizontal blocks)	4 3 5
N_y : (number of vertical blocks)	2 3 2
Res_x : (horizontal resolution)	1024 、1280 、1600, ···········
Res_y : (vertical resolution)	768 、1024 、1200, ···········
Block_x : (width of each block)	Res_x DIV N_x
Block_y: (hight of each block)	Res_y DIV N_y
Block_Start : (the starting address of each block)	
Line_Start : (the starting address of each row block)	
Source(x, y) : (the address of the pixel of the view image inside the block that is to be rearranged)	
Destination(X,Y) : (the pixel Source(x, y) of the view that is going to be rearranged will be rearranged to the address of the small Map Block at its corresponding Destination site)	

Processing Algorithm:

```
For (n = 0  to  N-1)
{
// Process the view image stored in each block in a sequential order
// Find the starting address of each block (Block_Start)
  Block_Start = (n DIV N_y) MUL Block_y MUL Res_x
                ADD (n MOD N_y) MUL Block_x
L_Destination(X, Y) = 0
For (y=1  to  Block_y)
{
// Process each block sequentially in an order of one row block
   followed by another row block
// Find the starting address of each row block (Line_Start)
Line_Start = Block_Start ADD (y SUB 1) MUL Res_x
```

F ig .5A

```
Destination(X,Y) = L_Destination(X,Y)
   For (x=1 to Block_x)
     {
      // Process each row block sequentially in an order of one pixel
         followed by another pixel
      // Find the pixel point (Source(x, y)) of the view image that is
         going to be rearranged
     Source(x, y) = Line_Start ADD (x SUB 1)
      // Rearrange the R, G, and B of the pixel point Source(x, y) to their
      correspon ding addresses
      // the R of the Source(x, y) should be rearranged to the R at the
      Destination(X1, Y1)
      // the G of the Source(x, y) should be rearranged to the G at the
      Destination(X2, Y2)
      // the B of the Source(x, y) should be rearranged to the B at the Destination(X3, Y3)
     DestinationRGB(X1, Y1, R) = Source(x,y). R
     DestinationRGB(X2, Y2, G) = Source(x,y). G
     Des      tinationRGB(X3, Y3, B) = Source(x,y). B

      // Horizontally shift the small Map Block at the Destination site to the address of next
      // small Map Block

         Destination(X, Y) = Destination(X, Y) ADD N_x
   }
         // Vertically shift the small Map Block point (N_y x N_y)
         // to the small Map Block in the next row
   L_Destination(X,Y    ) = L_Destination(X,Y) ADD
                               (N_y MUL Res_x)
   }
 }
```

Complementary Illustrations:

DestinationRGB(X, Y, R) is the address of R sub - pixel at the Destination(X,Y)
DestinationRGB(X, Y, G) is the address of G sub - pixel at the Destination(X,Y)
DestinationRGB(X, Y, B) is the address of B sub - pixel at the Destination(X,Y)
DestinationRGB(X, Y) is the address of the pixel point Source(x, y) corresponding to the small Map Block at the Destination site
DestinationRGB(X1, Y1, R), DestinationRGB(X1,Y1,G), and DestinationRGB(X1,Y1, B) are the mapping addresses of R, G, B respectively, which are corresponding to the address DestinationRGB(X,Y) of the small Map Block with one offset, wherein the offset is decided by Fn(n, Lx, rgb).

DestinationRGB(X1, Y1, R) = DestinationRGB(X, Y) + Fn(n, Lx, R)
DestinationRGB(X2, Y2, G) = DestinationRGB(X, Y) + Fn(n, Lx, G)

Fig .5B

wherin Fn(n, Lx, rgb) is a real time Hash Map Table for calculating the offset of the corresponding small Map Block address.

Parameter: n = number of view; each Fn has its corresponding Map Table

(different Destination Row(y) will result in different Map Value)

rgb = R or G or B

for example N=8

n = 0 ~ 7
Lx = 0 ~ 3
Rgb = R, G, B
Fn(0, 0, R) = 1
Fn(0, 0, G) = 5
Fn(0, 0, B) = 9
Fn(1, 0, R) = 2 + Res_x * 3
Fn(1, 0, G) = 6+ Res_x * 3
Fn(1, 0, B) = 10+ Res_x * 3
Fn(2, 0, R) = 2
Fn(2, 0, B) = 10
Fn(2, 0, G) = 6
Fn(3, 0, R) = 3+ Res_x * 3
Fn(3, 0, G) = 7+ Res_x * 3
Fn(3, 0, B) = 11+ Res_x * 3
Fn(4, 0, R) = 3
Fn(4, 0, G) = 7
Fn(4, 0, B) = 11
Fn(5, 0, R) = 4+ Res_x * 3
Fn(5, 0, G) = 8+ Res_x * 3
Fn(5, 0, B) = 12+ Res_x * 3
Fn(6, 0, R) = 4
Fn(6, 0, G) = 8
Fn(6, 0, B) = 12
Fn(7, 0, R) = 4+ Res_x * 3
Fn(7, 0, G) = 8+ Res_x * 3
Fn(7, 0, B) = 12+ Res_x * 3
....
....

Processing algorithm for stereoscopic image synthesizer

F ig .5C